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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/016,624	12/10/2001	David G. Wang	9926 (NCRC-0057-US)	4094

26890 7590 11/16/2005

JAMES M. STOVER
NCR CORPORATION
1700 SOUTH PATTERSON BLVD, WHQ4
DAYTON, OH 45479

EXAMINER	
PATEL, NIHIR B	

ART UNIT	PAPER NUMBER
3743	

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/016,624	WANG ET AL.	
	Examiner	Art Unit	
	Nihir Patel	3743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *september 10th, 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *7,9,10 and 37-39* is/are allowed.

6)☒ Claim(s) *1-4,13-15,17-19,21,22,24-26,28,29,31-36,40 and 45-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed on September 10th, 2005 have been fully considered but they are not persuasive. The applicant argues that Sagal does not disclose heat conduits extending through substantial portions of respective support structures of a block, where the block is divided into plural segments by the support structures containing respective heat conduits, the segments having respective heat conduction distances to enable dissipation of heat from respective heat conduits. The examiner disagrees. Sagal does disclose heat conduits extending through substantial portions of respective support structures of a block, where the block is divided into plural segments by the support structures containing respective heat conduits, the segments having respective heat conduction distances to enable dissipation of heat from respective heat conduits **(see column 3 lines 55-65)**.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims **1 through 4, 13 through 15, 24 through 26, 28, 29, 31-36, 40 and 45- 48** are rejected under 35 U.S.C. 102(e) as being anticipated by Sagal (US 6,651,732). **Referring to claim 1,** Sagal discloses an apparatus that comprises plural heat conduits **(see column 3 lines 55-65)**; and a block **12 (see figures 1-3 and column 4 lines 40-45)** formed of a thermally

conductive non-metallic material **(see column 4 lines 55-60)** having a first thermal conductivity; the block having airflow channels and at least two support structures, the heat conduits extending through substantial portions of respective support structures, each heat conduit having a second thermal conductivity, wherein the block is divided into plural segments by the support structures containing respective heat conduits, the segments having respective heat conduction distances to enable dissipation of heat from respective heat conduits **(see column 3 lines 55-65)**.

Referring to claims 2 and 3, Sagal discloses an apparatus wherein the first thermal conductivity is greater or equal to about 10 and less than or equal to 100.

Referring to claim 4, Sagal discloses an apparatus wherein each heat conduit is adapted to transfer heat from a heat source along its length **(see column 3 lines 55-65)**.

Referring to claim 13, Sagal discloses an apparatus wherein the thermally conductive material comprises a thermally conductive polymer **(see column 4 lines 55-60)**.

Referring to claim 14, Sagal discloses an apparatus wherein each heat conduit comprises a heat pipe **(see figures 2 and 3; column 3 lines 55-65; and column 4 lines 40-45)**.

Referring to claim 15, Sagal discloses an apparatus wherein each heat conduit comprises a tubular structure having a bore through which fluid is adapted to flow to transfer heat **(see figures 1-3; column 5 lines 67 through column 6 lines 1-3)**. It has been held that the recitation that an element is "adapted to" perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. ***In re Hutchison,* 68 USPQ 138**.

Referring to claim 24, Sagal discloses an apparatus that comprises providing a block **12 (see figures 1-3 and column 4 lines 40-45)** formed of a thermally conductive non-metallic

material **(see column 4 lines 50-60)** having a first thermal conductivity, the block having airflow channels and at least two support columns; and extending elongated heat conduits through respective substantial portions of respective support columns of the block **(see column 3 lines 55-65)**, each elongated heat conduit having a second thermal conductivity greater than the first thermal conductivity, wherein the block is divided into plural segments by the support columns containing respective elongated heat conduits the segments having respective heat conduction distances to enable dissipation of heat from respective heat conduits **(see column 3 lines 55-65)**.

Referring to claim 25, Sagal discloses an apparatus wherein extending the elongated heat conduits comprises extending heat pipes.

Referring to claim 26, Sagal discloses an apparatus wherein providing the block formed of the thermally conductive non-metallic material comprises providing the block formed of a thermally conductive polymer **(see column 4 lines 55-60)**.

Referring to claim 28, Sagal discloses an apparatus that provides a first one of the segments of the block on one side of a first one of the support columns to dissipate heat from the elongated heat conduit in the first support column; and providing a second one of the segments of the block on one side of a second one of the support columns to dissipate heat from the elongated heat conduit in the second support column.

Referring to claim 29, Sagal discloses an apparatus that comprises providing airflow channels through the first and second segments but not through the support columns.

Referring to claim 31, Sagal discloses an apparatus that comprises a component ; and a heat sink thermally contacted to the component, the heat sink having a block formed of a thermally conductive non-metallic material, the block having plural support structures, the heat

sink further having heat conduits extending through the structures dividing the block into plural segments, each segment having a respective heat conduction distance to enable heat transfer heat away from a respective heat conduit.

Referring to claim 32, Sagal discloses an apparatus wherein the heat conduits comprise heat pipes **(see column 3 lines 55-65 and column 4 lines 45-55)**.

Referring to claim 33, Sagal discloses an apparatus wherein the thermally conductive non-metallic material comprises thermally conductive polymer **(see column 4 lines 555-60)**.

Referring to claim 34, Sagal discloses an apparatus wherein the thermally conductive non-metallic material has a first thermal conductivity, and each heat conduit has a second thermal conductivity greater than the first thermal conductivity.

Referring to claim 35, Sagal discloses an apparatus wherein the first thermal conductivity is in the range between 10 and 100.

Referring to claim 36, Sagal discloses an apparatus wherein the heat sink further comprises airflow channels extending through the plural segments but not through the support structures of the block.

Referring to claim 40, Sagal discloses an apparatus that comprises plural heat pipes **(see column 3 lines 55-65)**; and a block **12 (see figures 1-3 and column 4 lines 40-45)** formed of a thermally conductive non-metallic material **(see column 4 lines 55-60)** having a first thermal conductivity, the block having plural support columns that divide the block into plural segments, the plural segments having airflow channels, wherein the support columns are without airflow channels **(see column 3 lines 55-65)**, the heat pipes extending through respective support columns **(see figures 1-3)**, each heat pipe having a second thermal conductivity greater than the

first thermal conductivity, the segments having respective heat conduction distances to enable transfer of heat away from respective heat pipes in the support columns **(see figures 1-3)**.

Referring to claim 45, Sagal discloses an apparatus wherein the airflow channels are provided in the plural segments but not provided in the support structures of the block **(see figure 1-3).**

Referring to claim 46, Sagal discloses an apparatus wherein the block has airflow channels in the segments but not in the support structures **(see figures 1-3)**

Referring to claim 47, Sagal discloses an apparatus wherein the block is formed of a thermally conductive polymer **(see column 4 lines 55-60)**.

Referring to claim 48, Sagal disclseos an apparatus wherein the heat conduction distances of the segments are generally the same **(see figures 1-3)**.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims **17 through 19, 21 and 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sagal (US 6,651,732) in view of Kuo et al. (US 2003/0000689). **Referring to claim 17,** Sagal discloses the applicant's invention as claimed with the exception of disclosing each heat conduit that has a first portion and a second portion angled with respect to the first portion, the first portion adapted to contact a surface of a heat source. Kuo discloses an apparatus that does provide each heat conduit that has a first portion and a second portion angled with

respect to the first portion, the first portion adapted to contact a surface of a heat source **(see figure 3)**. Therefore it would have been obvious to modify Sagal's invention by providing each heat conduit that has a first portion and a second portion angled with respect to the first portion, the first portion adapted to contact a surface of a heat source as taught by Kuo in order to improve the heat transfer process. It has been held that the recitation that an element is "adapted to" perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. ***In re Hutchison,* 68 USPQ 138.**

Referring to claim 18, Sagal discloses the applicant's invention as claimed with the exception of disclosing each pipe having a first portion that extends generally along the horizontal plane of the block and a second portion of each pipe extending generally along the vertical axis of the block. Kuo discloses an apparatus that does provide each pipe having a first portion that extends generally along the horizontal plane of the block and a second portion of each pipe extending generally along the vertical axis of the block. Therefore it would have been obvious to modify Sagal's invention as by providing each pipe having a first portion that extends generally along the horizontal plane of the block and a second portion of each pipe extending generally along the vertical axis of the block as taught by Kuo in order to improve the heat transfer process.

Referring to claim 19, Sagal discloses the applicant's invention as claimed with the exception of providing a heat conduit that has a second portion that is a shape selected from a group consisting of generally straight, generally S-shaped, and shaped as a loop. Kuo discloses an apparatus that does provide a heat conduit that has a second portion that is a shape selected from a group consisting of generally straight, generally S-shaped, and shaped as a loop **(see**

figure 3). Therefore it would have been obvious to modify Sagal's invention by providing a heat conduit that has a second portion that is a shape selected from a group consisting of generally straight, generally S-shaped, and shaped as a loop as taught by Kuo in order to improve the heat transfer process.

Referring to claim 21, Sagal discloses the applicant's invention as claimed with the exception of providing a block that has a first side edge, the second portion of a first of the heat conduits a first heat conduction distance from the first side edge. Kuo discloses an apparatus that does provide a block that has a first side edge, the second portion of a first of the heat conduits a first heat conduction distance from the first side edge. Therefore it would have been obvious to modify Sagal's invention by providing a block that has a first side edge, the second portion of a first of the heat conduits a first heat conduction distance from the first side edge as taught by Kuo in order to improve the heat transfer process.

Referring to claim 22, Sagal discloses the applicant's invention as claimed with the exception of providing a block that has a second side edge, the second porton of a second one of the heat conduits a second heat conduction distance from the second side edge. Kuo discloses an apparatus that does provide a block that has a second side edge, the second porton of a second one of the heat conduits a second heat conduction distance from the second side edge. Therefore it would have been obvious to modify Sagal's invention by providing a block that has a second side edge, the second portion of a second one of the heat conduits a second heat conduction distance from the second side edge as taught by Kuo in order to improve the heat transfer process.

Allowable Subject Matter

Claims **7, 9, 10 and 37-39** are allowed.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nihir Patel whose telephone number is (571) 272-4803. The examiner can normally be reached on 7:30 to 4:30 every other Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Bennett can be reached on (571) 272-4791. The fax phone number for the organization where this application or proceeding is assigned is (5710 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nihir Patel
November 3rd, 2005

Henry Bennett
Supervisory Patent Examiner
3700